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PAPERS
IN
M E C H A N I C S.

The GOLD MEDAL of the Society was this Session voted to the Chevalier PAUL ASSALINI, Physician to Prince Eugene of Munich, for his Improvements in Surgical Instruments and Operations. The following Communications were received from him, four explanatory Engravings are annexed, and a Collection of the Instruments is preserved in the Society's Repository.

SIR,

DURING twenty years of medical and surgical practice in hospitals and armies on the continent, I have made improvements in many surgical instruments, and invented others, which diminish the difficulties attending operations, and render their success less dubious. The instruments have been examined by some of the most eminent Surgeons in London, and their approbation of them has

encouraged me to express to the Society of Arts, &c. the desire which I have to submit them to their inspection and respectable opinion, before I return to Italy.

I have the honour to be,

Sir,

Your obedient servant,

PAUL ASSALINI.

7, Manchester-Street, Manchester-Square, London.

October 25, 1815.

To C. TAYLOR, M.D. SEC.

CERTIFICATE.

CHEVALIER ASSALINI, Professor of Surgery at Milan, being desirous of carrying into Italy some testimony of the degree of estimation in which his ingenuity and professional merits were held by men of science and practitioners in surgery in London, we have much pleasure in complying with his request, and declaring that we are induced, from every thing we have seen, to rank his talents very high, and to consider his contrivances for the relief of wounded men, very ingenious.

JOSEPH BANKS, P.R.S.

EVERARD HOME.

Soho-Square, London, Nov. 15, 1814.

MY DEAR SIR,

I REGRET that we are so soon to lose your company; nor can I let you depart from this country, without testifying my sense of the gratification and information I have derived from your society. The candour and liberality with which you have communicated important professional information, the ingenuity you have displayed, in the construction of various surgical instruments, and the unremitting attention which, it is evident, you have paid throughout life, to the advancement of professional knowledge, have impressed me with sentiments of respect and regard for your character, with which, be assured, I shall always remain,

Your sincere friend and servant,

JOHN ABERNETHY.

Bedford-Row, Nov. 17, 1814.

To Professor Assalini.

I HAVE examined the instruments of the Chevalier Assalini, with all the attention in my power. They mark a mind of superior ingenuity, and one very fertile in contrivances to lessen the difficulties of operations. Those which have struck me, as deserving more than common praise, are, first, the double forceps, well adapted to take up an artery separately from the accompanying nerve, or when situated so as to be deeply buried.

Secondly, his forceps for aneurism, are well adapted to produce the object which he has in view. This, how-

ever, is said without meaning to decide upon the superiority of such an operation for aneurism over others.

Thirdly, his instrument for making an artificial pupil, which appears to me peculiarly adapted for the purpose.

The kind notice which he has taken of the labours of others, in his work on the Artificial Pupil, manifest a liberal spirit, and a mind anxious to improve the profession, of which he is an ornament.

ASTLEY COOPER.

The forceps I used in an operation yesterday, and found them to answer extremely well.

October 8, 1814,

PROFESSOR ASSALINI, having demonstrated to us the particulars of the instruments herein expressed, we are happy in the occasion of declaring our entire approbation of them,

WILLIAM BLIZARD.

THOMAS BLIZARD.

MY DEAR SIR,

I FEEL very sensibly the honour you have done me in submitting your valuable improvements in several chirurgical instruments to my inspection. To say that much mechanical ingenuity is exhibited in the contrivance of them, is the least of their praise; for they appear to me to

to constitute a most useful and important addition to our stock of instruments, by which many great operations may be performed with unusual safety and facility, and the hazard and suffering, subsequent to various accidents, may be remedied, or greatly diminished. Your portable case of amputating instruments, possesses so many evident advantages, that it ought to be regarded as an important benefit conferred on naval and military surgery.

I have the honour to be,

My dear Sir,

With great respect and esteem,

Your's, most faithfully,

JOHN PEARSON, F.R.S.

Surgeon of the Lock Hospital and Asylum,
Consulting Surgeon of the Public Dispensary, &c. &c.

Golden-Square, Nov. 16, 1814.

To the Chevalier Assalini,

8, Bucklersbury, Nov. 6, 1814.

MY DEAR SIR,

I LEARN with regret that you are about quitting London; I shall ever entertain a lively recollection of your readiness to communicate your improvements of many practical points in surgery. Circumstances, which I could not controul, have unfortunately prevented me from profiting by this disposition to the fullest extent; nevertheless, I beg permission to express to you the pleasure I derived from all I had an opportunity of witnessing. Your Double Tenaculum

Tenaculum Forceps, for taking up arteries, is a manifest improvement—your Sound, will greatly facilitate the making of counter openings—your Retractor admits of being applied in an instant, and must effectually accomplish the purposes for which it is intended. Your contrivance for the management of fractures, which I had an opportunity of witnessing in use at St. George's Hospital, unites simplicity with the easy attainment of every indication. Perfect steadiness is given to the limb, all irregular pressure completely avoided ; permanent extension and counter-extension, when required, are, in your contrivance, of easy execution ; whilst the wounds, in compound fractures, can be readily dressed. I must leave to the accouchers the task of doing justice to the valuable additions you have made to their important branch of the profession. I sat down only with the intention of expressing my thanks to you, and wishing you a safe return to your native country ; but I have been led away to speak of what we owe you. Excuse this digression, and believe me,

My dear Sir,

Ever your's,

GEORGE YOUNG.

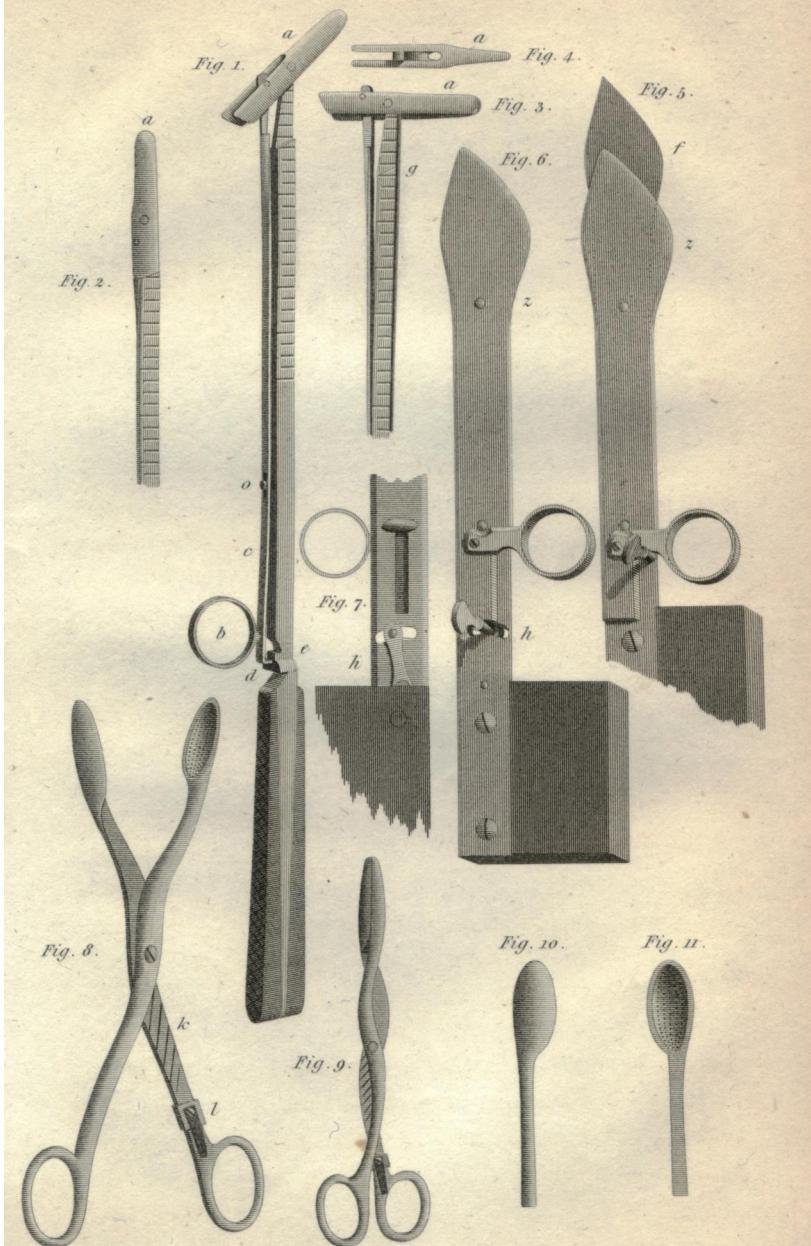
Chevalier Assalini.

Charlotte-Street, Nov. 12, 1814.

MY DEAR SIR,

I BEG leave to thank you for the loan of your Manual of Surgery, which I have read with much attention. It appears to me to contain many valuable facts and observations, especially on *Hospital Gangrene—on the Treatment*

*The Chevalier Apsalinus Instruments for
LITHOTOMY.*



ment of Fractures, which is particularly adapted for military practice, as the apparatus employed is simple, and can be easily procured in all climates, and in all situations—no trifling advantage in active service.

Your portable case of instruments contains more in a small compass than I ever saw, and some of the instruments are of a new construction (at least so far as I know) the double tenaculum in particular, I consider to be of great utility in military surgery, especially for operations in the field of battle.

Immediately after you had the goodness to leave your portable case of instruments with the Board, Mr. Stodart was directed to make a similar set, which are now making; and I believe it to be the intention of the Board to recommend several sets to be sent out to Canada, for the use of the surgeons in the field.

I have the honour to be, with much esteem,

Dear Sir,

Your's, very faithfully,

W. FRANKLIN.

Chevalier Assalini.

PROFESSOR ASSALINI having explained to me the apparatus invented by him for the treatment of fractures of the lower extremity, I have employed it in the case of a patient in St. George's Hospital, and I have great pleasure in stating, that I find it extremely useful, and to answer perfectly well the purpose for which it is intended.

B. C. BRODIE,

Assistant Surgeon of St. George's Hospital.

Sackville-Street, London, Nov. 16, 1814.

I HAVE

I HAVE seen the apparatus for fractures in use at St. George's Hospital, and am perfectly satisfied with its utility and effects, as well as with its very excellent and simple principle.

ROBERT KEATE,

Surgeon Extra to the Queen, and Surgeon
of St. George's Hospital.

Albemarle-Street, Nov. 16, 1814.

SIR,

I HAVE examined the numerous instruments invented and improved by Professor Assalini, and have frequently conversed with him on their mode of application.

The apparatus for broken limbs is a well constructed compact fracture box, and appears well adapted to keep the limb perfectly steady.

The amputation instruments rest their merit on their portability, which to the military surgeon may be an object of much importance.

The Tenaculum is certainly much superior to the common one, and will be found a very useful instrument on many more occasions than taking up arteries; it embraces the smallest point, and from the form of the blades, directs the ligature to the exact spot required to be included. When applied to any given point, it remains steadily fixed, without any effort of the surgeon, however much the stump may be agitated by spasms, or the patient moved by the rolling of a ship.

The Double Forceps are well adapted to convey a ligature round the artery, without incurring any danger of including

ding the nerve; a circumstance of great moment, when efficient medical assistance cannot be obtained. They are also calculated to convey a ligature round a vessel, situated in a narrow deep wound, to the bottom of which the fingers cannot reach.

The Compressor of Arteries, recommended in cases of aneurism, in lieu of the ligature, appears adequate to fulfil the end in view, but it requires more frequent trials to establish its superiority, particularly in the operation on the external iliac artery, where the pressure of a hard foreign body might be expected to produce inflammation of the peritoneum.

The Canula with the grooved needle is likely to prove useful in establishing counter openings in extensive suppurations.

The instrument for making an artificial pupil is superior to any I have seen, as it acts both as a cutting instrument to divide any adhesions, and as a pair of forceps to remove a portion of the iris. I would, however, venture to suggest as an improvement, that the straight fixed blade should be with the cutting edge, and the shorter moveable blade should be the guard, or, in other words, that they should be exactly reversed from their present arrangement. In this form I conceive it would be much more manageable than it is at present, as the short projecting handle passes against the edge of the orbit, and there is no room for the fingers to act in opening the forceps. By changing the order of the blades, the projecting handle would be towards the operator, and would be more easily depressed with the thumb. There would also be an advantage in thus having the sharp instrument, with which the iris is to be perforated quite firm, and continuous with the handle.

The

The Attractor Vesicæ, though not necessary in young subjects, may facilitate and render less hazardous the operation for the stone, in cases where, from the accumulation of fat, there is much depth in the perineum.

The Double Gorget appears complicated, and difficult to manage, and does not offer any benefit to outweigh these objections, as there can be no necessity for retaining it in the bladder, and consequently no need of a sheath to cover the cutting edge, the staff being quite sufficient as a director for the forceps.

The Stone Forceps are decidedly much superior to those in common use. Their peculiar form admits of a considerable extention of the blades within the bladder, with scarce any expansion of the handles in the tract of the wound, which enables the operator to pass a second pair, to ascertain, by the graduated scale on the handles, the exact dimensions of the stone, and thus embrace it in the direction most favourable for extraction.

On a careful consideration of the various contrivances brought forward by the Professor, and from frequent conversations with him, I am of opinion, that he possesses great promptitude and discrimination, in detecting the sources of difficulties in operations, and a most happy facility in the construction of means to obviate them in future.

I feel happy in offering this feeble testimony in praise of his merits, and think that he richly deserves every encouragement from the Society of Arts, &c.

I am, most truly your's,

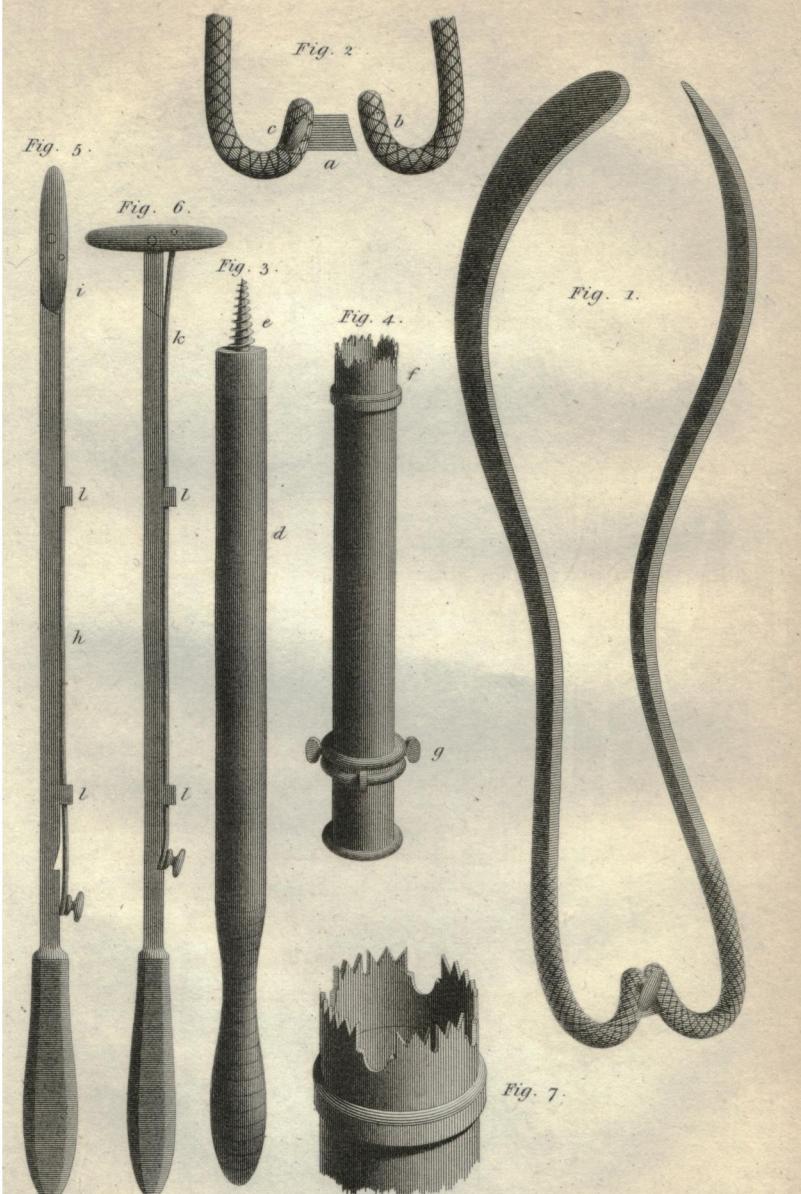
HENRY EARL.

Berner's-Street, Nov. 5, 1814.

To C. TAYLOR, M.D. SEC.

CERTIFICATES

The Chevalier Apsalinis' Obstetrical Instruments.



CERTIFICATES were also received from,

Dr. GEORGE PEARSON, George-Street, Hanover-Square.

Dr. ROBERT GOOD, Senior Physician to the Westminster Lying-in Hospital and Lecturer in Midwifery at St. Bartholomew's Hospital.

Dr. SAMUEL MERRIMAN, Physician Accoucheur to the Middlesex Hospital, and Westminster General Dispensary.

Mr. CHARLES MANSFIELD CLARKE, of Saville-Row.

Mr. ROBERT WATT, of Glasgow.

Mr. J. BRIGGS, Edgware-Road.

Mr. BLAIR.

Mr. WANT; and other Medical and Surgical Gentlemen.

Reference to the Engravings of the Chevalier ASSALINI's Surgical Instruments. Pls. 7, 8, 9, 10.

Instruments for Lithotomy, or Extraction of the Stone from the Bladder. Pl. 7. Fig. 1 to 11.

Figs. 1, 2, 3, 4, shew different views of the straight staff, with a moveable extremity *a*. Fig. 1, is a whole-length view of the instrument, with its extremity *a* in an inclined position. By means of the ring *b* on the sliding spring *c*, confined by the screw *o*, this extremity can either be placed in a straight line with the staff, as shewn in fig. 2, or in a transverse direction, as in fig. 3, and retained in the first situation by hooking into the notch *d*, and in the transverse situation in the notch *c*.

Fig.

Fig. 4, shows the moveable extremity as detached from the instrument.

This instrument is introduced in a straight direction along the groove of the common staff used in lithotomy, through the incision made in the perineum, until it enters the bladder; the common staff is then withdrawn, and the spring of the straight one pushed forward by the forefinger through the ring *b*, which occasions the extremity to assume the transverse direction, as shewn in fig. 3, carrying a cross lever on the staff, with which the bladder is to be drawn toward the perineum, and the distance from the interior of the bladder to the exterior wound, is ascertained by observing the graduated scale on the outside of the instrument.

The gorget, fig. 5, is now to be introduced, by sliding it along the groove in the straight staff, shewn in fig. 3, at *g*. This gorget is made without any beak, with one broad cutting edge *f*, the opposite side of which is blunt, and adapted to the groove in the staff, fig. 3. The cross piece, fig. 4, at the extremity of the staff, prevents all possibility of the gorget being thrust too deep. When the section of the neck of the bladder has been accomplished, the sheath *z*, which is closely fitted on the surface of the gorget, is pushed forward to cover the cutting edge, as shewn in fig. 6; this is prevented from receding by a small sliding stop *h*, fig. 7. The straight staff is now to be withdrawn, and the forceps, fig. 8, introduced on the surface of the gorget. The peculiar curve which is given to the forceps, admits of the expansion of the blades within the bladder, with scarcely any extension in the tract of the wound; and the graduated scale *k* on the handles, enables the surgeon to know with certainty the exact dimensions of the stone to be extracted. The form of
the

the forceps permits a second pair, fig. 9, considerably smaller, to be passed upon them to the stone, which also ascertain, by a graduated scale, the dimensions of the stone, in the opposite direction, and thus enable the operator to extract the stone in its smallest diameter. A sliding stop at *l*, fig. 8, prevents the stone from being crushed by too great pressure of the blades in its extraction. Figs. 10 and 11, shew the internal and external structure of the extremities of the forceps, which have a considerable resemblance to a duck's beak.

The forceps may be introduced along the staff instead of the gorget.

Reference to the Chevalier ASSALINI's Obstetrical Instrument. Pl. 8. Figs. 1 to 7.

Fig. 1, shews the forceps, made with flat blades, without any hollow, and connected at the extremity of the handles by a small wedge, shewn at *a*, fig. 2, which passes from one to the other, entering a groove, shewn by the dotted lines at *b*, fig. 2, and holds the blades firm together. The blades do not cross each other, and therefore there is no risk of compressing the head improperly in extracting the child. The wedge *a* is retained in one of the handles, by a small screw *c*.

The instruments for extracting the head of a dead child consist in a solid cylinder of wood *d*, fig. 3, terminating in a sharp-pointed screw *e*, about six lines in length, the worm of which is sharp; the screw to be introduced along the finger of the accoucheur, and screwed into the bone of the cranium of the child, where it is firmly fixed. Over

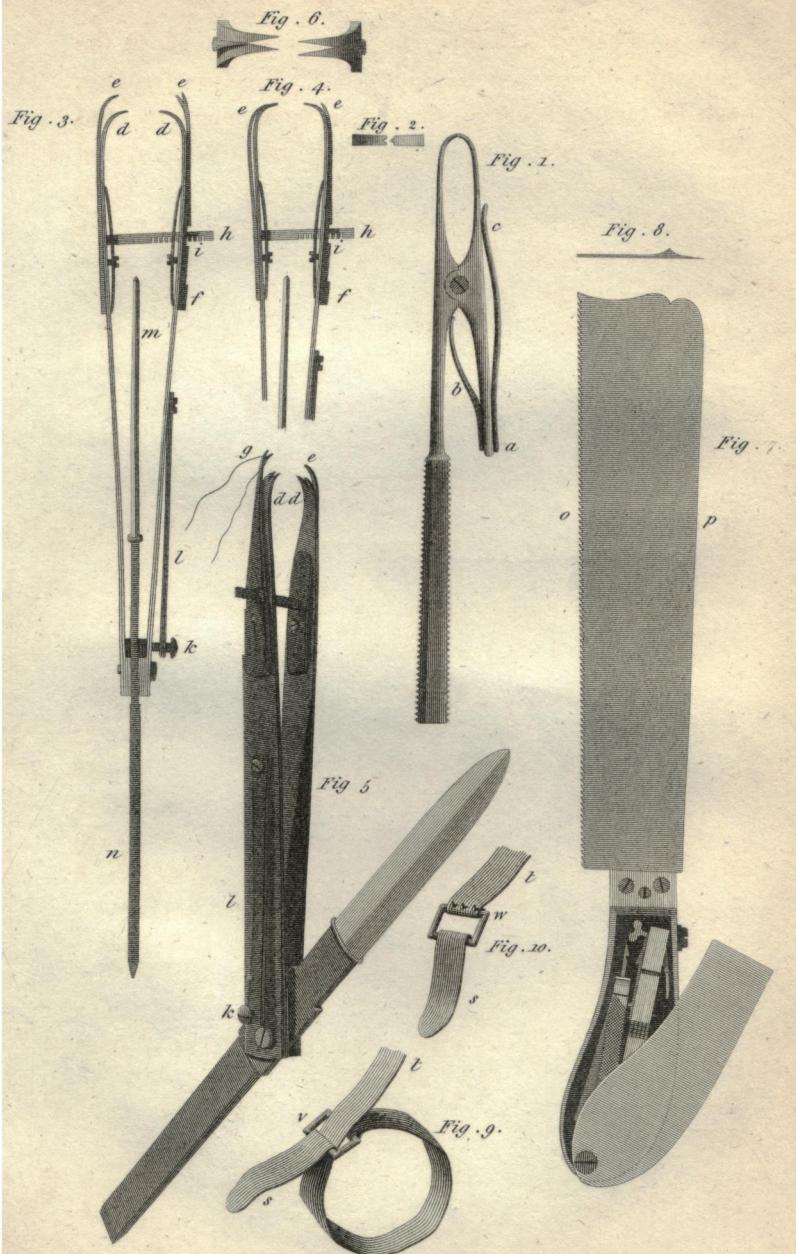
this solid cylinder, a tube, fig. 4, is next passed, at the extremity of which, a trephine *f* is fixed. This trephine acts by turning it backwards and forwards, upon the end of the solid cylinder, by the handle or studded ring *g*, and a circular portion of bone is thus cut through, which is removed by withdrawing the solid cylinder. After this, the long staff *h*, fig. 5, with a moveable extremity *i*, similar in principle to that used in lithotomy, is to be introduced through the hollow cylinder *f*, fig. 4, into the cranium; and the extremity, moved transversely, by means of the spring which runs through the loops *l*, as shewn at *k*, fig. 6. This staff is to be moved in different directions, till the texture of the brain is destroyed. The cross lever *k* may be afterwards used to draw out the head of the child. Fig. 7, is an enlarged view of the head of the trephine.

The blades of the forceps are to be introduced separately, and when one is placed on each side of the child's head, the handles are connected by the wedge, and a firm grasp allowed to the hand of the operator.

Reference to the Engraving of the Chevalier ASSALINI's Amputating Instruments. Pl. 9. Figs. 1 to 10.

Fig. 1, shews the double tenaculum, which consists of a small pair of forceps, the blades of which are separate, but converge at the points. One blade terminates in a single point; the other has two points at its extremity, as shewn more distinctly at fig. 2; the single point falls within the double points, so as to secure the smallest artery. By pressing with the thumb on the part *a*, which forces

The Chevalier Assalinis' amputating Instruments.



forces down the inner spring *b*, the blades are opened to take hold of the artery. On taking off the pressure of the thumb, these points unite, and hold the vessel firmly without any effort on the part of the surgeon. The converging extremities of the blades direct the ligature to the exact part where the vessel should be tied; and the ligature, by means of this instrument, can be effected without an assistant. The spring *c* retains the ligature thread, previous to its application.

Figs. 3, 4, 5, 6, represent a double pair of forceps, for tying an artery without incurring the risk of including the nerve, whilst the ligature is making; they consist in a pair of dissecting forceps, forked at their extremities *ddd*, figs. 3 and 5. On the outside of each blade, a smaller one *ee*, *ee*, *ee*, figs. 3, 4, 5, are closely fitted, and made to slide up and down by a stud *f*, so as to project beyond the points of the former blades. One of these blades has a groove at the extremity, in which the ligature thread is placed, as shewn at *g*, fig. 5. The two external blades are connected by a small bar *h*, notched on one side to receive the upper blade at *i*, when pressed forwards by the stud *f*, and thus keep the forceps fixed, without any effort of the surgeon.

The converging form of the blades directs the thread to the exact spot, where the ligature should be made.

The extreme points of the blades are shewn more distinctly in an enlarged view of them, at fig. 6.

This instrument contains also a sheathed catlin, or small double-edged knife, and a file with a screw-driver at its end, which are retained firm in their position by a pin *k*, fig. 5, fixed in the spring *l*, and which pin goes into a hole in each blade. In fig. 3, the catlin is shewn in the body of the instrument at *m*, and the rasp *n* extended

tended lengthways, so as to form a handle for the instrument. In fig. 5, the catlin and rasp are shewn, in an inclined position. When the catlin is used, the rasp is in the body of the instrument, and the body of the instrument forms the handle for the operator, which is also the case when the rasp or screw-driver are to be used, and the catlin returned to its place.

Fig. 7, represents the portable amputating instruments used in the French army. A steel well-tempered blade, about two inches broad, and nine inches long, is formed on one edge into a saw o, and on the other into a knife p; this knife edge is made like a razor, for the greater facility of being sharpened. Within the handle of this instrument, which is shewn half open at r, are contained all the other instruments requisite in the field of battle; as a catlin, a tenaculum, forceps—all made to fit one handle, besides needles, ligature, thread, &c.

Fig. 8, shews a section of the blade and the razor-edge of the knife.

Figs. 9 and 10, represent a simple band tourniquet, in which the band, passing through a buckle, is retained firm on three upright fixed teeth. The short strap s, fixed on one side of the buckle, holds it firm, whilst the long strap t, passing through the buckle v, and pulled close, is attached to the teeth w, and firmly secured.

Reference to various detached Instruments of the Chevalier ASSALINI'S. Pl. 10. Fig. 1 to 11.

Fig. 1, shews the wooden case for fractured legs, extending from the middle of the thigh to some distance below

below the foot; this is hollowed out to the form of the limb. A vacancy is left under the ham at *a*, and at the calf *b*. The lower end at *c* is excavated to the extent of several inches, to admit of the application of the foot-board *d*, which moves upon an iron pin *e* running through it. Holes are made at different distances, to allow of the apparatus fitting limbs of different lengths. The foot-board *d* is secured in a proper position on this pin by means of two linen bands, one of which passes round the upper part of the board, and is fixed to the slits *ff* on the sides of the case, about half way down the leg; the other band passes in the opposite direction of the foot-board, to the slits *gg*, below the foot-board, and is there secured: retaining the foot-board in a fixed position. The foot-board is notched at the sides, to prevent the descent of these bands; *hh* are leather straps, for confining the limb in a proper situation, by means of the pins *ii*, on the sides of the case.

Fig. 2, represents the arterial compressor, which consists of a pair of forceps, not crossing each other, but turning on a centre *k*. The extremity of the blades is for about 1-8th of an inch broader and flatter than the upper part, as seen at *b*. Below this the blades are narrower, in close contact, and bevelled off at each side at an angle of about 45 degrees, forming an edge sufficiently sharp, as seen at the section, fig 3, to cover the division of the internal coat of the artery, when the blades are forcibly compressed by the screw *m*, which passes through the handles. In using the instrument, the screw *m* is only used to accomplish this division of the internal coat; it is then unscrewed, and the permanent compression left to the weak spring *n*, between the handles, which is sufficiently powerful to

arrest the current of blood, without causing ulceration of the external tunic,

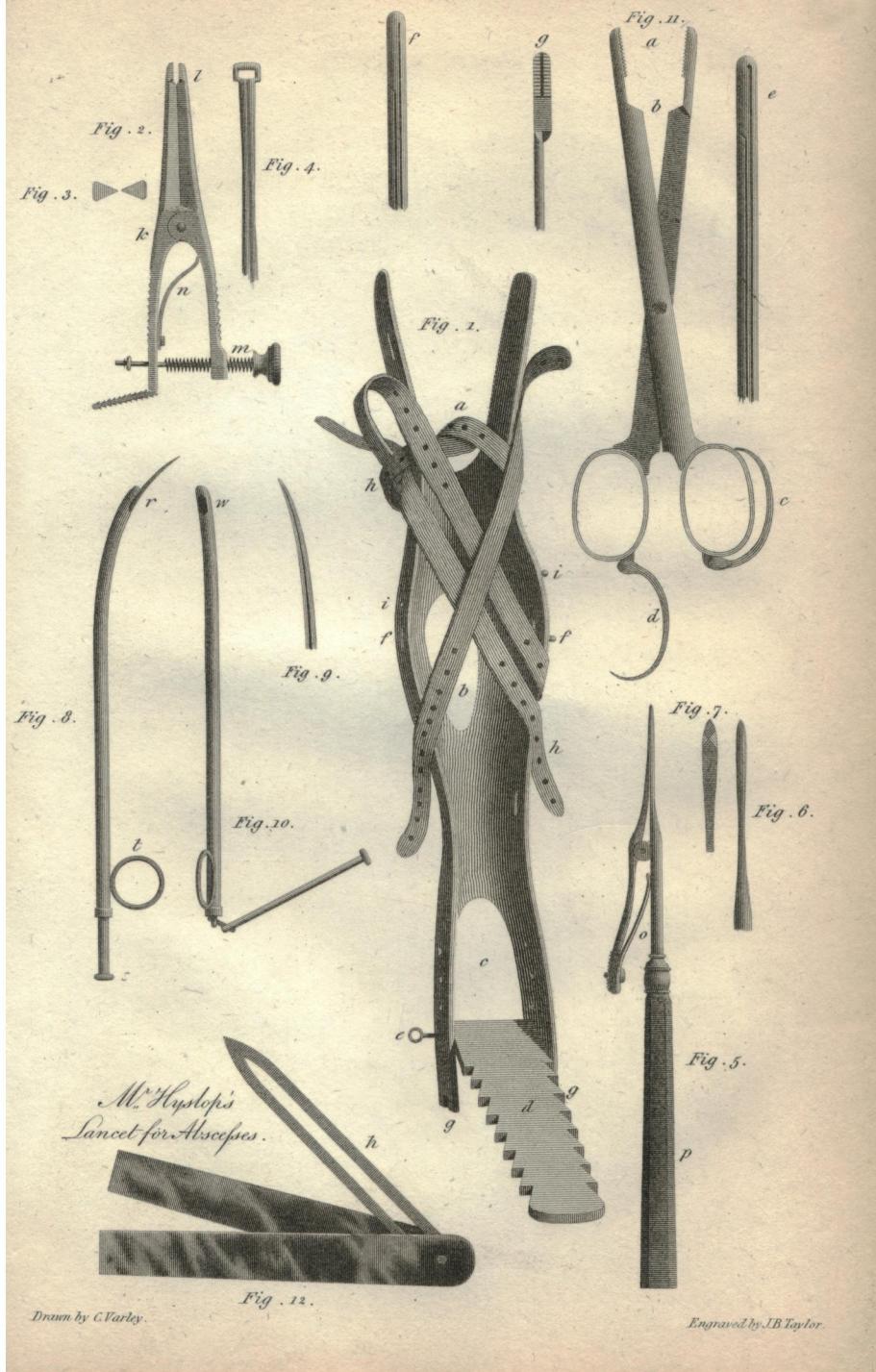
Fig. 4, is an external view of one of the blades.

Fig. 5, is a representation of the instrument for making an artificial pupil to the eye. It consists of a pair of small forceps, the blades of which are very flat, and closely adapted to each other. One blade, fig. 6, has a sharp cutting edge, and is rather spear-shaped; the other, fig. 7, is blunt, and somewhat broader than the cutting blade, so as to cover it, and prevent it from acting as a sharp instrument, when the two are in close contact. A small spring *o* between the handles retains the blades shut, except when the handles are pressed by the operator. A wooden handle *p* is attached to one side of the forceps. When the instrument is to be used, an opening is to be previously made into the transparent cornea, through which the closed forceps are introduced, with the cutting blade towards the iris. If the pupil is quite closed, the blades are to be slightly opened, and the spear-shaped one passed through the iris near the centre, and carried forward until it reaches the ciliary processes. The blades are now to be closed, and the portion of the iris contained between them is to be quietly drawn out at the opening in the cornea, and then detached with a common lancet or scissors.

When the iris is simply adherent to the capsule of the lens, and the pupil not imperforate, the cutting edge may be employed in freeing any such adhesions. It may likewise be used for removing the adherent opaque portions of capsule, which often remain after operations for the cataract,

Fig. 6, is an instrument for making counter openings in sinusses; or deep wounds; it consists of a silver tube, resembling

The Chevalier Assalini's various detached Instruments.



sembling a female catheter, containing a long spring needle, the pointed part of which is shewn, with its groove, at fig. 9, and a small part thereof projecting from an orifice in the tube at *r*, fig. 8. The sound, containing the covered needle, being introduced into the sinus, and reaching the bottom of it, the point of the needle is then forced outwardly through the skin, by pressing on the head of the needle at *s*, whilst the tube is held by a finger through the ring *t*. When the needle appears through the skin, the groove in its point acts as a director for a scalpel, to enlarge the opening. The handle of the needle is made with a joint, shewn at *v*, fig. 10. This joint answers the double purpose of comprising the instrument in a less space when not in use, and of preventing the point of the needle being protruded through the opening *w*, until the puncture is to be made.

Fig. 11, is a combination of various instruments in one, with a view to portability. It is here shewn open, and displays a pair of forceps at *A*, a pair of scissors at *B*, a tenaculum at *C*, and a needle at *D*. The backs of each blade serve as directors, one of which shewn separate, has a stop at the end, at *E*, to prevent the scalpel from cutting farther; the other *F*, has no stop. The inner part of one of the ends of the forceps is shewn at *G*; it has a small longitudinal groove in the centre, and teeth cut across to make it hold firmer.

The SILVER MEDAL was this Session voted to JOHN HYSLOP, Esq. of Fenchurch-Street, for an improved Lancet for opening deep-seated Abscesses. The following Communication was received from him, an explanatory Engraving is annexed, and the Instrument is preserved in the Society's Repository.

SIR,

I BEG leave to lay before the Society of Arts, &c. a lancet of my invention, for opening deep-seated abscesses, and I herewith send one for their inspection. The advantages arising from it are several: 1st, the instant the lancet reaches the gas or fluid contained in the abscess, it will be known from the matter freely flowing out through the opening in the blade. This prevents the necessity of a second or third puncture, which often alarms the patient, occasions extra pain, and agitates the surgeon.

The common lancet being wedge-shaped, plugs up the opening, as it passes in making the puncture, and thus no fluid can escape until it is withdrawn; therefore if the surgeon has not been fortunate enough to push the blade as deep as the fluid, a subsequent puncture must be made.

2dly. If it is necessary to pass a probe, this can easily be done, if my instrument is used; or if it be adviseable to dilate the aperture, a bistoury can be passed for that purpose into the opening of the blade.

3dly. Another advantage attends my instrument, which is, that the blade remaining in the opening while the fluid passes through the aperture; its discharge is not stopped or

or checked by the intervention of any tendon or fascia, which frequently occurs in the use of the common lancet, and which it is of consequence to prevent.

This instrument has been repeatedly tried, and always found to answer well; and there is no doubt of its diminishing the pain usually experienced in the opening of abscesses.

I remain, Sir,

Your obedient servant,

JOHN HYSLOP,

Fenchurch Street, Dec. 13, 1814.

To C. TAYLOR, M. D. SEC.

CERTIFICATES.

SIR,

I BEG leave to state, that I was present with you on Sunday the 12th instant, when you opened a very large abscess, which had formed under the lower angle of the scapula, beneath the dorsal muscle. It had been found, that the common abscess lancet would not pierce this muscle; and the patient, being timid, would not submit to an extensive incision through the integument, so as to expose the muscle, and get cautiously into the abscess, without the risk of plunging the lancet into the lungs. The abscess was of very considerable size; the matter being in the beginning formed under the scapula, and dropped down, it could not well be known, by means of the common lancet, whether it had reached it, or whether the lancet (from the absence of discharge) had gone too far

far, and pierced the cavity of the chest. Your lancet, however, seems quite to answer the purpose, and remove all fears ; for by its strength, it pierced the strong muscle, and the opening in the blade of the lancet allowed the discharge of the matter. We could see that it had gone sufficiently deep, and *not too far*.

Besides this, through the said opening we could introduce a small probe, so that the orifice of the skin, and the orifice of the muscle, could be kept in contact, and so managed, as to allow the free discharge of the matter, which was thus all evacuated. I never before saw such a lancet as your's, and I think it an ingenious and useful improvement.

I remain, Dear Sir,

Your's sincerely,

JOHN MITCHELL, M. D.

To John Hyslop, Esq. 60, Fenchurch-Street.

THIS is to certify, that I think the invention of Mr. Hyslop is highly ingenious ; that such an instrument was much required, and cannot fail to be useful.

ASTLEY COOPER.

New Broad-Street, April 5, 1815.

Reference to the Engraving of Mr. HYSLOP's Lancet for opening deep-seated Abscesses. Pl. 10. Fig. 12.

The principal difference between this and the common lancet depends upon the longitudinal opening H made in the

the blade. When the lancet penetrates the abscess, the pus or matter contained therein, immediately flows out through the aperture, and prevents a repetition of the puncture, frequently required with the common lancet.

The SILVER MEDAL and FIFTEEN GUINEAS were this Session voted to Mr. RICHARD WILLIAM FRANKLIN, No 3, Stracey-street, New Compton-street, for a Lifting and Forcing Pump, or Double Piston Pump, to raise Water. The following Communication was received from him, an explanatory Engraving is annexed, and a Model of the Pump is preserved in the Society's Repository.

SIR,

I BEG leave to submit to the inspection of the Society of Arts, &c. my new invented double lift pump, in one barrel, and with one handle or lever.

This pump is very simple, of easy construction, and throws a double quantity of water, with the usual labour, and can be made at very little more expence, than a common pump.

This pump consists of one barrel, in which two pistons work, each furnished with a double valve. The two piston rods are connected to the handle at opposite sides of the axis, so that as one piston ascends, the other descends, keeping up a continual stream.

The

The common lifting pump is well known; but mine is an improvement upon it, and will convey the water to the cistern at the top of a house, to serve all the dressing rooms, water closets, &c. in the house.

It appeared to me that such an instrument would be useful to thousands, and likewise merit the sanction and approbation of the Society of Arts.

Many attempts have been made, to make pumps to answer a similar purpose, and I have a thorough knowledge of them all by experience, as a workman.

De la Hires lifting and forcing pump, is too complicated, and too dear, and no common pump, that works with two handles, is worth any thing.

I am, Sir,

Your humble servant,

RICHARD WILLIAM FRANKLIN.

Stracey-Street, St. Giles's,

March 29, 1815.

To C. TAYLOR, M.D. SEC.

*Reference to the Engraving of Mr. WILLIAM FRANKLIN's
Double Piston Pump. Pl. 11. Figs. 1 and 2.*

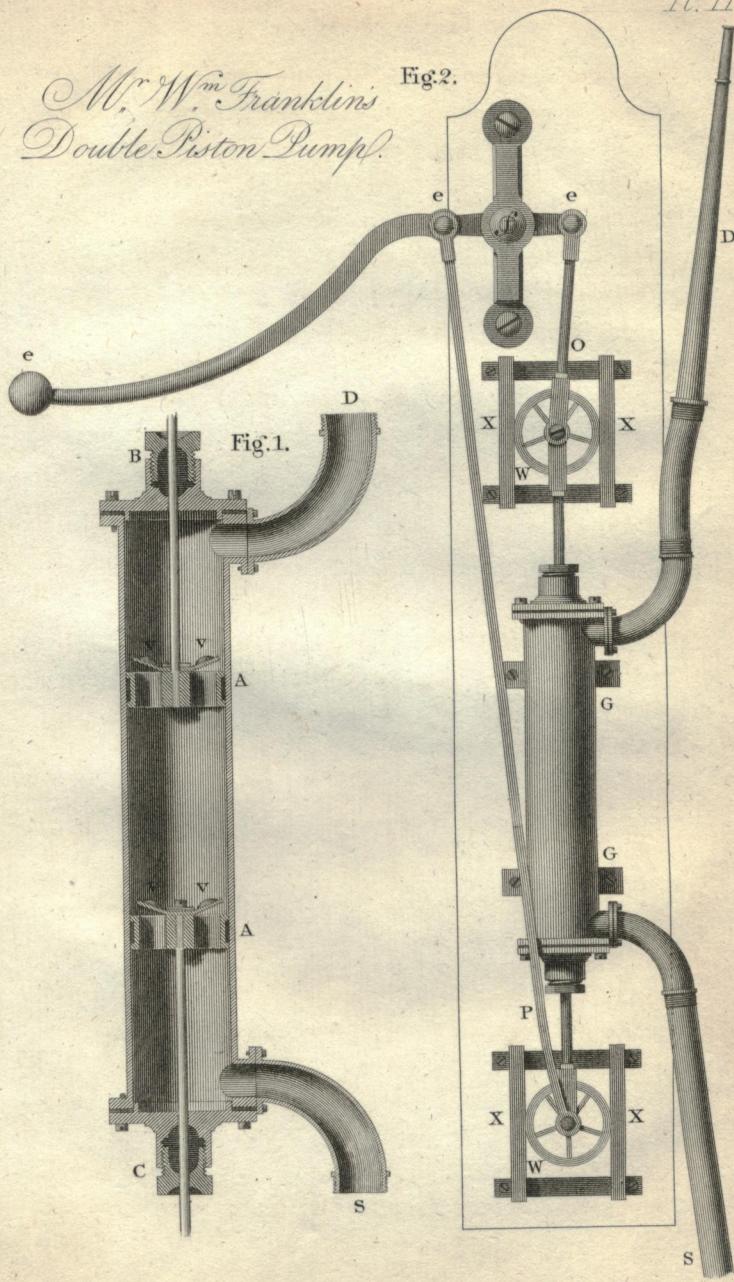
Fig. 1, is a section of the pump. A. A. are two pistons, on the upper face of each is a double valve, v v v v; the upper piston rod passes through the stuffing-box B, and the lower through the stuffing-box C. S is the suction pipe, and D the discharging pipe.

Fig. 2, is an external view of the pump; e e e the lever or handle; F the fulcrum, on which the handle moves;

GG

Pl. II.

*Mr W^m Franklin's
Double Piston Pump.*



Drawn by J. Clement.

Engraved by James Davis.

G G the pump cylinder; w w the wheels which revolve between the standards x x x x, and which conduct the piston rods parallel to the cylinder; e p the conducting rod which conveys the motion of the handle to the lower piston; e o the conducting rod, which gives motion to the upper piston. It is evident, when the handle or lever is lifted, that the upper piston is pressed down, and the lower piston is at the same time elevated, with its valves shut, which forces the water through the upper piston and the discharging pipe at the same operation. And when the handle is *pressed* down, the upper piston rises with its valves closed; and the water, in its ascension, is forced through the discharging pipe: at the same time, the lower piston descends, by which action its valves are opened, and introduces a supply of water equal to the contents of the cylinder, minus the capacity of both pistons. The peculiar advantages of this pump, with double pistons, are, that with a six-inch stroke it discharges a quantity of water equal to twelve inches of the cylinder; and so, in this proportion, by always doubling the quantity of the stroke, whatever it may be; and thus furnishing a product just equal to two common pumps of the same stroke and capacity of cylinder, and certainly with less than a proportionable friction and expence.

TWENTY GUINEAS were this Session voted to Mr. ALEXANDER LAW, of Deal, for his Improved Telegraph, or Method of conveying Intelligence to and from Sea and Land. The following Communication was received from him, an explanatory Engraving is annexed, and a Model of the Apparatus, with a Key to the Signals, is preserved in the Society's Repository.

SIR,

I BEG you will be pleased to lay before the Society of Arts, &c. for their Inspection, a model of a semaphoric telegraph, of my invention. In consequence of hurts received, I have been discharged from His Majesty's Ship Monmouth, of which I was a midshipman. In the two last wars, my father and three brothers younger than myself, have fallen in the service of their country.

The certificates of good conduct which I can produce for a period of twenty-one years, would have enabled me to pass an examination, and look forward to the provision which is intended to be made for that class of petty officers, but unfortunately the hurts I received prevented me entering into active service afloat. It was during this time, that I have been constantly endeavouring to bring the telegraph to perfection, having had the charge of the signal duty at the Port-Admiral's Office, at Deal, for the last seven years.

I beg leave to state, that if the Society pleases, I will attend personally with the key of my telegraph and its explanation. I have the honour to be, Sir,

Your obedient humble servant,

ALEXANDER LAW.

London, Dec. 9, 1814.

To C. TAYLOR, M.D. Sec.

CERTIFICATES.

CERTIFICATES.

I HEREBY certify, that I have carefully examined the model of a semaphoric telegraph, presented to me by Mr. Alexander Law, Midshipman of H. M. S. Monmouth. I have witnessed the making and use of it, at my Office, at Deal, and I am of opinion, it will answer the service he proposes, and that it is likely to be of great public utility, and I believe it to be his own invention. He likewise suggested to me, an addition to the twelve-shutter telegraph, which caused an entire saving of bunting, and communicated signals more speedily and accurately.

Given under my hand this 7th day of December, 1814.

THOMAS FOLEY,
Vice-Admiral.

CERTIFICATES to a similar effect were produced from the following Officers :—

THOMAS BOYS, Post Captain of H. M. S. Zealous.
H. DOWNMAN, late of the Princess Caroline.
W. WILKINSON, late Captain of H. M. S. Monmouth.
JAMES HENRY GANELEY, Commander of H. M. sloop Parthian.
JAMES WEMYSS, Captain of H. M. S. Rainbow.
F. WELSTEAD, late Lieutenant of H. M. S. Monmouth.
ROBERT BOYLE, late Lieutenant of the Jason.
DAVID CREE, Lieutenant, late Superintendant of the Admiralty Telegraph at Deal.

Reference

Reference to the Engraving of Mr. Laws' Telegraph. Plate 12, fig. 1, 2, 3.

FIG. 1 is supposed to be a fourth-rate top-mast, in length 54 feet, supported by four stays or shrouds a, a, a, a, in the usual manner, that a mast or flag-staff is secured on shore. The signals are given by four different lever-arms or signs b, c, d, e, they at present represent the signals, (see list of signals in the Society's Repository); the motion is given to the lever-arms by ropes, called topping-lifts; each arm having two and three rings, at proper distances on each, and to each ring is attached a brass-plate, with its number on it.

The arm b, represents a cross-arm or T; the arm c, a circular plate; the arm d, a straight bar; and the arm e, a spear head. These arms move on fulcrums at f, f. Fig. 2 represents the lever-arm c. singly, and moveable on a fulcrum at f, having its topping-lifts made fast to a ring, at the shortest end of the lever.

The cross trees g g g g, have two holes in the end of each, through which the topping-lifts are conducted; thereby affording an angular purchase to move the arm in any required direction: the other three arms are worked in the same way; h h represents the bottom part of the mast, with two hooks k, k, to pitch the rings 1, 2, 3, 4, 5, and 6, that are on the two topping lifts, according to the position in which it is required to place the arm when in use, and which correspond with the dotted positions, numbered as above.

Fig. 3, is a horizontal section, shewing the motion for turning the signal-post to any required direction: m, is the top-mast; n, is the head of the lower-mast: p, s, the two

two pulleys that conduct the rope; r, is the roller; y, the winch; k, k, k, k, hooks for the rings to which they are attached when in action.

The mast is turned round by means of the winch and roller, the middle of the rope having four spiral turns round the roller; the ends pass up on each side of the mast, and the one passes through the check block at S; and, being wrapped or wound three or four turns round the lower part of the top-mast, descends through the opposite block at p; an eye being spliced on both ends of the rope, they are drawn tight, as occasion may require, by means of a lanyard rove through them, thus forming an endless rope, by which the top-mast and cross-trees are faced to any direction, and secured there by means of a click and ratchet-wheel, on one end of the roller.

* * It appeared on examination by the Committee of the Society, that a Telegraph on this construction would save one hundred and sixty yards of bunting, or cloth used in the present signals, and give the signals more distinctly.

That one arm, on this construction, has been employed at the Signal House at Deal; by Mr. Law, which answered perfectly; which arm, though four and a half feet long, and placed twenty-five feet high, was worked with ease and dispatch; and that the same plan could easily be used on the flag-staff or mast of a ship, without being impeded by the wind or sails.

Mr. Law has also a Night Telegraph on a similar principle, and which answered on trial at the distance of a mile and a half.

The SILVER MEDAL was this Session voted to Mr. ALEXANDER LAW, of Deal, for his Method of securing Ships' Guns and Carriages. The following Communication was received from him, an explanatory Engraving is annexed, and a Model of the Apparatus preserved in the Society's Repository.

SIR,

I BEG leave to lay before the Society a model of a method of securing ships' guns and carriages, by means of my right and left-handed screw, lever, and hook nuts. This invention will enable one man to perform the duty of seven, and in one-third part of the time secure the gun for sea-service. It possesses the advantage of great safety where new breechings are used, which require to be tightened or re-secured at sea, in the event of being taken by a gale of wind. In such a case one man can with ease tighten and secure all the guns on the lower deck without danger, by taking one or two turns with the lever of the screws; whereas in the common span lashing, you must take all but two turns off before you can again span the breeching in; and, in general, when the lower deck guns are in want of fresh securing, all the men quartered at those guns are necessary at that time ; and, it is further evident, that a single man to each gun, with my apparatus, will re-secure them in less time than all the men that are quartered, on the present system. I flatter myself this invention will meet with the approbation of the Society ; and I remain,

Sir,

Your obedient servant,

ALEXANDER LAW.

To C. TAYLOR, M.D. Sec.

CERTIFICATES.

M. A. Lavis,
Telegraph.

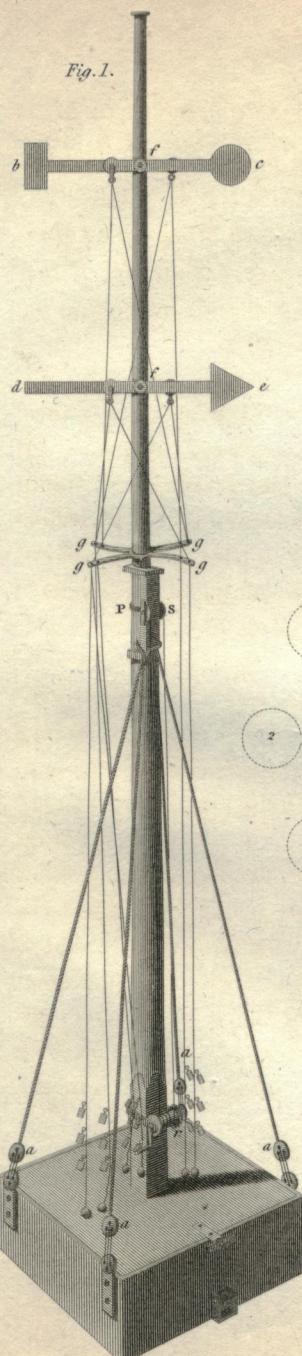


Fig. 1.

*M. A. Lavis, Screw
for securing Gun Carriages.*

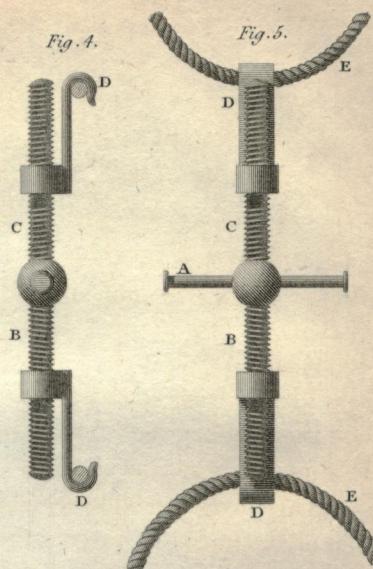


Fig. 4.

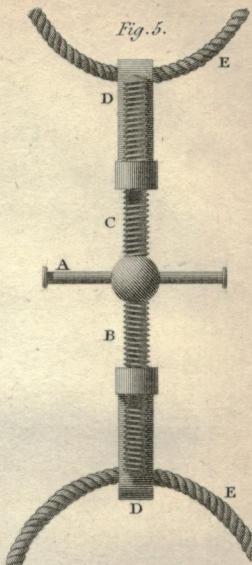


Fig. 5.

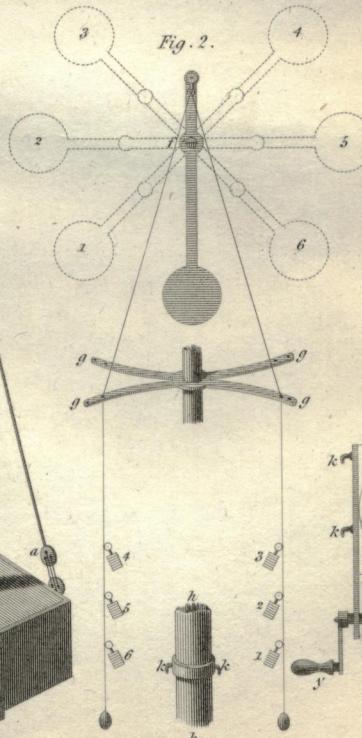


Fig. 2.

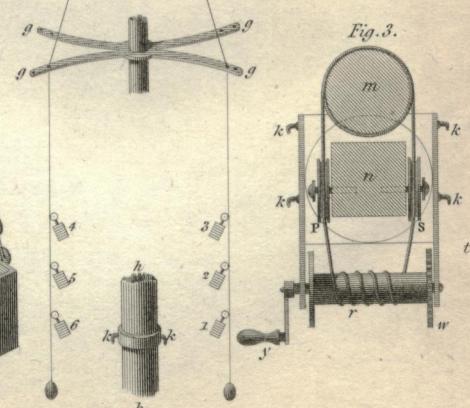


Fig. 3.

CERTIFICATES.

CERTIFICATES in favour of Mr. LAW's method of securing ships' guns and carriages were received from the following Naval Officers, viz. ADMIRAL FOLEY, CAPTAIN BOYS, CAPTAIN DOWNMAN, CAPTAIN WILKINSON, CAPTAIN GANELY, CAPTAIN WEMYSS, LIEUT. WEILSTEAD, LIEUT. BOYLE, and LIEUT. CREE.

Reference to the Engraving of Mr. LAW's Screw for securing Gun Carriages. Plate 12, Figs. 4 and 5.

FIG. 4 and fig. 5, represent Mr. LAW's plan of lashing gun carriages, &c. by means of an apparatus, with a right and left-handed screw. A the lever; B, B, the left-handed screw; C, C, the right-handed screw; D, D, D, D, hooks for laying hold of the ropes. The act of turning the screws by the lever A, one way, extends the hooks from the ball or head of the screws, and slackens the ropes; and, by turning them the contrary way, the hooks move towards the head or fall of the screws, and thereby render the ropes tight.

The SILVER MEDAL and TEN GUINEAS were this Session voted to Mr. J. BUCK, of Fort-Place, Bermondsey, for an Instrument to examine the State of Ships' Bottoms whilst at Sea, or to discover Articles sunk in Water. The following Communication was received from him, an explanatory Engraving is annexed, and a Model of the Instrument is preserved in the Society's Repository.

SIR,

HEREWITH you will receive the model of an apparatus for examining the bottoms of ships whilst at sea. Having been upwards of seven years in the Navy, I have often experienced the want of such an instrument, and during a voyage from Bengal to Madras in His Majesty's Ship Macassar, commanded by Captain Wilbraham, in cruising off the Land Heads, the ship struck, and rode across a rock for six hours, and after getting her off, the Captain was doubtful whether the ship's bottom was injured or not. I then asked leave to try an experiment for ascertaining the fact; which being granted, I made an instrument on a similar plan to the model I have sent you, by the aid of which we discovered that the ship's bottom was materially injured. We therefore put back again to Bengal, where she was broken up.

If this discovery had not been made, the ship would have been in a most dangerous predicament.

The usual mode to ascertain any damage which a ship may be supposed to receive at sea, is to make to the nearest

est port, where she is hove down or laid on her side, to be examined, which takes up a considerable time, as the guns must be shifted, and it is often found necessary to put the cargo on shore.

I have lately repeated here the experiment of my instrument in the presence of a Member of the Society of Arts, &c. and it was tried in the Thames, near London Bridge, where, though the water was very thick, the experiment was found to answer completely.

This invention will not only be found useful for the above purpose, but may be advantageously employed for discovering bodies or any thing valuable that may have fallen into any water where their situation is nearly known.

By the recommendation of several friends, I am induced to make the invention public through the medium of the Society of Arts, if they should think it deserving of their notice.

I am, Sir,

Your humble servant,

J. BUCK.

Bermondsey, February 2d, 1815.

To C. TAYLOR, M.D. Sec.

THE Society being desirous to ascertain accurately the merits of Mr. Buck's invention, a Committee was appointed to meet at the London Docks, to make there an experiment of Mr. Buck's apparatus.

By the assistance of Captain Walton, Dock Master, who obligingly accommodated them with the Launch,

and also politely attended them with other boats, manned for the purpose; and Mr. Buck, the Claimant, having provided himself with an instrument ten feet long, and six inches diameter, made of tinned iron plates painted, containing an oval object-glass, about $\frac{1}{2}$ inch thick ; the Committee proceeded to examine the bottom of a vessel named the Tiger ; and notwithstanding the day was cloudy, and the water in the Docks very much discoloured, so that objects to the naked eye were visible but at a very small depth below the surface, yet by means of Mr. Buck's instrument, they were able to examine the planks and seams very distinctly to the depth of full seven feet below the surface of the water. It being suggested that the nails and sheathing of a copper-bottomed vessel would present a much better opportunity of proving the merits of the invention, the Committee proceeded to the Golden Grove ship ; and, under similar circumstances as before, they clearly discovered the fastenings, &c. at a depth of between 8 and 9 feet : but on the sun breaking out, the effect was much improved, and it appeared to them that there was no doubt that a leak, or any other injury, might, under such circumstances, be discovered with great ease ; and they were fully of opinion that the invention is well calculated to answer the intended purpose.

Reference to the Engraving of Mr. Buck's Instrument for examining Ships' Bottoms. Pl. 13.—Fig. 1, 2.

Below the ship, fig. 1, a, b, a tin tube, 9 inches diameter is shown, the length to suit the ship's draught in the water. This is suspended from the ship's side by a rope, fastened

fastened to a ring in the middle : the bottom b is closed by a strong plate glass, placed obliquely to prevent the light of one tube being reflected from the glass up the other, so as to bend the rays in their passage from the water to the air, thereby giving a more direct view of the bottom than could otherwise be obtained: rising from the same base is a tube d, lessening to the top e, and as close to the large tube as the observer's head will allow. The observer, in a boat, looks into this small tube, and sees part of the ship's bottom which receives light down the large tube. A weight, c, is hung near the bottom to sink the tubes.

Fig. 2 shows the tubes upon a larger scale ; the end, b, is enlarged by a rim to fasten the plate glass in water tight, without lessening the aperture ; the ring, to which the suspending line is to be attached, is shown about the middle of the larger tube.

The SILVER MEDAL was this Session voted to Mr.

*RICHARD WILLIAMS, of His Majesty's Dock Yard,
Chatham, for his method of removing the Centres
of Brick or Stone Arches, without risque to the
workmen. The following communication was re-
ceived from him, an explanatory Engraving is pre-
pared, and a Model of the Apparatus is pre-
served in the Society's Repository.*

DEAR SIR,

THE bearer hereof, Mr. Richard Williams, is the inventor of a contrivance for easing at the same moment a centre of *any length*, particularly useful in tunnels, or other long arches ; and it has been practised with success upon some of the ordnance works of this place, as the cer-

tificate of Colonel D'Arcy, the Commanding Engineer, specifies. The man, who is a carpenter, will bring with him a model of the apparatus, which he begs leave to submit to the Society for consideration, and if the Society should think it worthy of their attention and patronage, he will be proud of the honour.

Believe me, dear Sir,

Your obliged and humble servant,

H. T. ELLICOMBE,

*His Majesty's Dock Yard, Chatham,
April 11th, 1815.*

CERTIFICATE.

THE model sent is on a scale of half an inch to a foot, showing, of connected centring, sixty feet in length, and nineteen feet in width, resting on inclined planes.

It is the invention of Richard Williams, Master Carpenter in the Royal Engineer Department at Chatham, and there put into practice in a bomb proof casemate the twenty-seventh of August, 1807 ; by this means the centres can be lowered, until they are freed from the arches, without exposing the men, so employed, to any accident ; and, at the same time, not requiring one fourth of the hands employed in the usual way.

This mode may be of great use, when the centres have to carry great weights, or when the pressure on them is rendered unequal from moisture, or other causes in tunneling, and by guarding against the evil often attending the partial easing of centres in those cases.

The

The parts of the inclined planes, next the front shores, are to be equally measured, and cut agreeably to the casting required, or until the centres are freed from the arch. Three men, having each a wooden mallet of twenty-two pounds weight, and striking at the same time, would soon drive the inclined planes the distance required.

Three screw jacks were substituted for mallets, in lowering centres of thirty feet square, and answered equally well.

R. D'ARCY,
Colonel of the Royal Engineers,

Chatham, April 11th, 1815.

To C. TAYLOR, M. D. SEC.

SIR,

In consequence of the many accidents, which have occurred from the common mode of easing centres, and on account of nine men having been lately killed in a bomb-proof cazern, I turned my mind to the subject, and have invented a method by which inclined planes can be struck, and removed externally without any person being underneath. I believe my plan will be found different from any hitherto applied for such purpose.

I am, Sir,

Your humble servant,

RICHARD WILLIAMS.

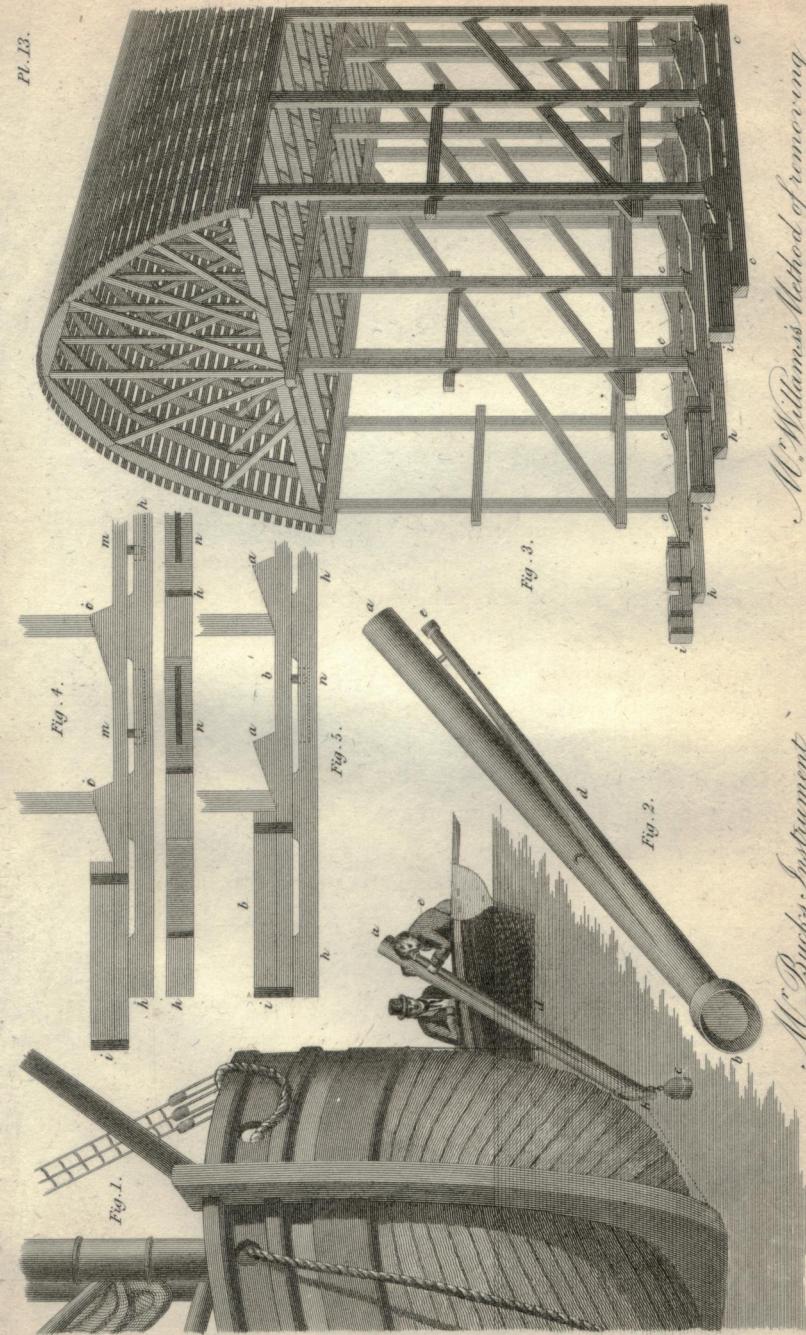
Chatham, April 20th, 1815.

To C. TAYLOR, M.D. SEC.

Reference

Reference to the Engraving of Mr. WILLIAMS' method of removing the Centres of Arches. Plate 13, Figs. 3, 4, 5.

FIG. 3 shews the centring for arches, on three rows of upright posts; each row standing on a separate row of wedges e e e, f f f, g g g; each of these rows being in one solid piece, act together, and slide on another timber h h h; these timbers are solid under the wedges, but their surface lowered a little between, to lessen friction. The centring at first stands on the top of the inclined planes, as at fig. 4: when the centring is to be lowered, the workmen, with mallets, strike the ends i i i at once, stops being placed at the other ends, to prevent their being lowered too much; when the work has settled enough, they are driven still farther; and, after driven quite down as in fig. 5, the centring is then loose enough to take away. By this means, three men first ease, and then loosen the whole centring, without going under it, avoiding danger, and the whole centring comes down so perfectly uniform, that the arch must settle uniformly also. *Pins are fastened in the upper timbers at mm. Fig. 4 moving in grooves n n, in the under timbers, to keep them from slipping.*



Mr. Williams's Method of removing
the Centers of Ships' Bottoms.
for examining Ships' Bottoms.

Drawn by W^m. Hunt.

Engraved by G. Cudworth.

The THANKS of the Society were this Session voted to the REV. THOMAS RIDGE, of Kincote, near Lutterworth, for his Method of preventing the Necessity of sweeping Chimnies. The following Communication was received from him, an Explanatory Wood Cut is annexed, and Drawings of various Modes of applying this Principle are preserved in the Society's Repository.

SIR,

As the state of the chimney-sweepers has for various good reasons moved the consideration of the humane part of society, and excited their benevolent wish that some plan might be formed to lay their avocation totally, or in a great measure, aside, the following easy plan for so doing is respectfully recommended to the Society of Arts, &c.

I am, Sir,

Your humble Servant,

THOMAS RIDGE.

*Kincote, near Lutterworth,
October 1st, 1814.*

To C. TAYLOR, M.D. SEC.

Observations.

WITHOUT going into philosophical reasons of the plans I propose, I beg leave to state the following facts:—

1st,

1st, That every recess in a chimney, whether parallel to the shaft of the chimney (as is often the case in large chimneys made smaller) if totally closed up at the bottom, or even at right angles to the chimney, is in a great measure filled with soot long before the chimney becomes foul.

2dly, In a house I formerly occupied, there was a flue from a study, which was connected with an elbow of perhaps 8 feet into an old chimney, stopped up at the bottom; and whenever it was swept, the chimney-sweepers universally said, "they need not get up the other chimney, for there was no soot in it," or words to that effect. The reason had not occurred to me at that time, nor for a long time afterwards. Just before I left the house, the bottom of the chimney was accidentally opened, when many bushels of soot were found deposited in the bottom of the upright chimney, below the part where the elbow entered it.

3dly, In visiting different manufactoryes, and other places where there are long flues, I have always learnt that they were continually bursting from the accumulation of soot. Considering the causes of which, together with other circumstances relative thereto, I was induced to make an experiment, by hanging my two coppers according to fig. 2; one of which was used perhaps four times every week; the other about twenty times in the year. The result in four or five months was, that in the first, the whole body of soot was found in the receiver, and not half a pint of soot and dust together in the chimney. It then remained for seven or eight months, when, again the soot was found deposited in the receiver, and an equally small quantity of dust and soot in the chimney above. On opening

opening the other at the end of nearly two years (when I left the house) the soot was found in the receiver, and none in the chimney.

4thly, In my present residence, the same experiment has been made for two years, and the same result as before.

I therefore now submit it to the public, and no doubt the idea once thrown out will be improved upon, and made applicable to many excellent purposes.

It has been my case to have lived in houses belonging to other persons ; and where there has been no other opportunity of making the experiment on an extended scale, and so bringing it in a more mature state before the public. As it is, they are presented with it, in the hope that it will be found applicable to their convenience, comfort, and security, in a very material degree ; and also, in some measure, tend to relieve a degraded part of society from a most irksome and injurious employment.

I have exemplified the principle by a variety of sketches sent. I have to apologize for the indifference of the drawings, which I have been little accustomed to. The intention is only to show that plan which I conceive most convenient and suitable to the above excellent purpose ; and which, from a conviction of its practicability and efficacy, I shall adopt upon a larger scale, whenever I have a house of my own, or a convenient opportunity.

THOMAS RIDGE.

Reference

Reference to the Wood Engraving of the 'Rev. Mr. Ridge's Chimney, Flues, and Soot Receptacles.'

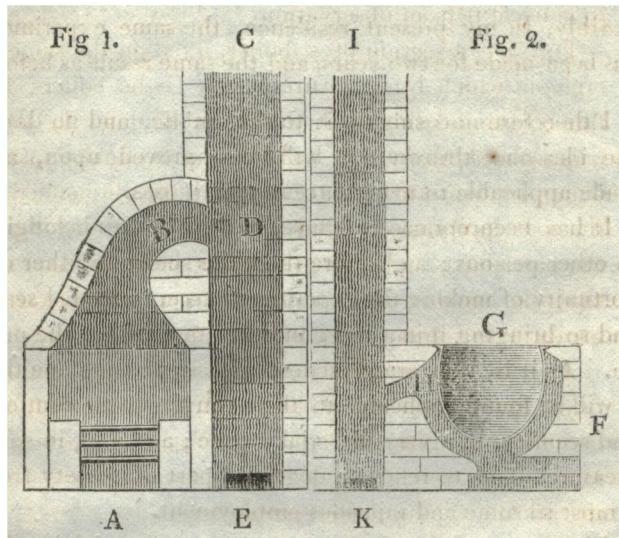


Fig. 1, is a section of a fire-place, chimney, and flue, with a soot receiver by the side.

A, the fire-place.

B, the bend or elbow of the chimney, communicating with the main chimney at D.

The main chimney C, extends from the floor to the top of the house; the open part conveys away the smoke into the air; the part below D, is the receptacle into which the soot falls, and from whence it is occasionally taken out at a small door E. This door should be of brick or stone, made to fit close, and should be put in with well-tempered clay or loam, so as totally to exclude the air.—*For the utter exclusion of any draft of air through the bottom or sides of the receiver, is the great principle.*

Instead

Instead of a stone door, a double iron door might be made behind the skirting board in a sitting-room, and a sliding piece of the skirting board fitted to shut it, so as to conceal it from observation.

Fig. 2, is a section of a boiler, fixed on the same principle, in which F is the fire-place; G the boiler; H the flue communicating with the main chimney I; the soot falls into the receptacle K, and is occasionally taken out from the door at the bottom. It is recommended, that the soot receptacle be made in all cases rather wider than the part above the elbow where the smoke enters, in order that the damp or cool air of the receptacle may have a greater effect upon the smoke as it passes.

The elbow, or part between the fire and the main chimney, should occasionally be swept by a servant, with a common house broom.

SIR,

PERMIT me, through you, to return my best thanks to the Society of Arts, &c. for the attention they have paid to my communication, and the manner in which it has been conveyed to me, and I shall be more gratified to find, that the plan suggested may, when more matured, be an effectual means of contributing to the comfort and convenience of the public, as well as the beneficial purpose specified.

This principle is not confined merely to common fire-places or flues; but, agreeably to the sketches I have sent to the Society, may be extended to stoves, hot-walls, drying-rooms, &c. by forming proper soot receptacles, as circumstances may require.

I beg

I beg leave also to add a circumstance which has lately come to my knowledge, which confirms, in some measure, the efficacy of my plan.

Being lately at Mr. Lush's, of Banbury, I shewed him a sketch of my plan, which, having considered, he said he could confirm it from experience, though it had not occurred to him before. That, wishing to convert a part of his house, where there was no chimney, into a temporary back-kitchen, he could not build a chimney on the outside, it being a narrow passage leading to premises not belonging to him; and the chimney could not be carried through the rooms above. He therefore built a small chimney from the ground, in his own yard, and turned an arched flue nearly in the form of fig. 1 into it; under the ceiling. There was a small hole left near the ground (in consequence of the mason observing, that perhaps some soot would fall down there), and stopped with two or three loose bricks. The soot did fall wholly, and was repeatedly taken out there. That, on the chimney being taken down above seven years after it had been built, the part of the chimney above the flue had no soot adhering to it, and the greater part was scarcely coloured with soot. I have stated the account in nearly his own words.

I remain, Sir, respectfully,
Your obedient servant,

THOMAS RIDGE.

*Kincote, near Lutterworth,
Feb. 22d, 1815.*

To C: TAYLOR, M. D. SEC:

The

The SILVER MEDAL of the Society was this Session voted to Mr. JOHN RAFSON, Millwright and Brass-founder, Penryn, Cornwall, for an improved Stop or Drag for Carriages going down hill. The following communication was received from him, an explanatory Engraving is annexed, and a Model of the Apparatus is preserved in the Society's Repository.

SIR,

I HAVE found out an improved plan for dragging carts &c. of which I have sent the Society a model. The drags are applied to the naves of the wheels, with a chain attached, fastened to the breeching of the horse, and a small pin on each side of the shaft is to go into the hole of the bar of the drag. Take out one of the pins, and you will find one wheel dragged and the other not. By leaving out both pins, the two wheels are dragged in going down hill, by the breeching bearing against the horse. The wheels will revolve round on the level road, and in going up hill undrag themselves. When the wheels are braced, two or three tons weight have very little pressure on the horse in going down hill.

If two loaded carts should meet on a narrow hill, by unhooking the drag-chain from the breeching, and hooking it to the tub-chain, the horse can be put back with the greatest ease and safety.

When the horse is put back against the hill, the two pins must be put in the bars of the drags.

L

This

This plan will answer extremely well for artillery gun-carriages, coaches, waggons, gigs, &c.

I hope this plan will meet the Society's approbation, and that they will think it worthy of reward.

I am, Sir,

Your obliged humble servant,

JOHN RAPSON

Penryn, March 15, 1815.

To C. TAYLOR, M.D. SEC.

Reference to the Engraving of Mr. Rapson's Drag for Carriages. Plate 14, Figs. 1, 2, 3, and 4.

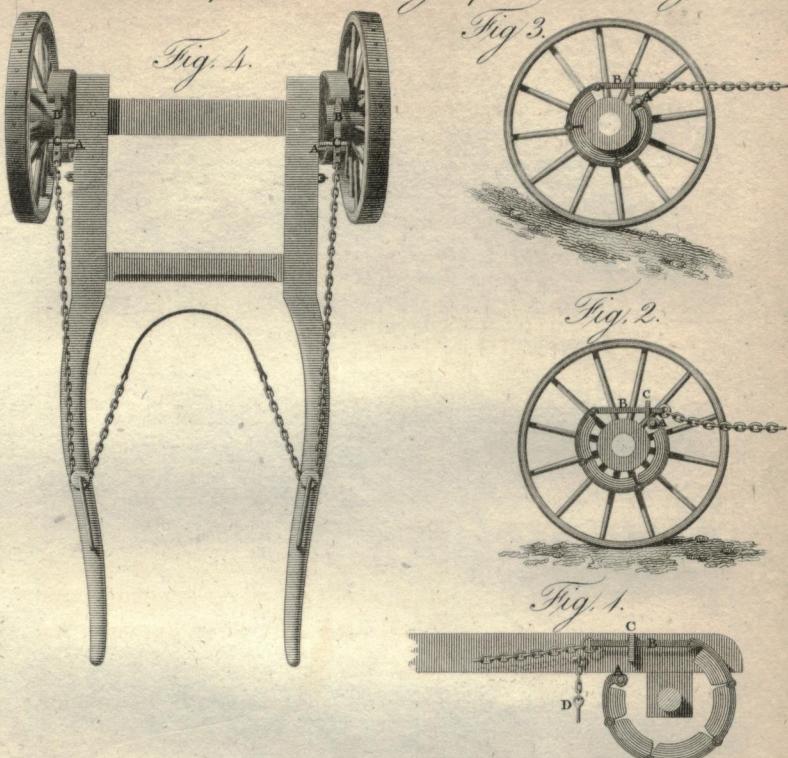
The drag consists of a wooden brake, applied round the nave of each wheel, the pieces of which are encircled and connected by a jointed metal plate.

To one end of this brake a small bar is attached which slides freely through a corresponding hole in a plate fixed at right angles to the shaft; a hole is drilled through this sliding bar for the purpose of admitting a pin or forelock chained to the shaft.

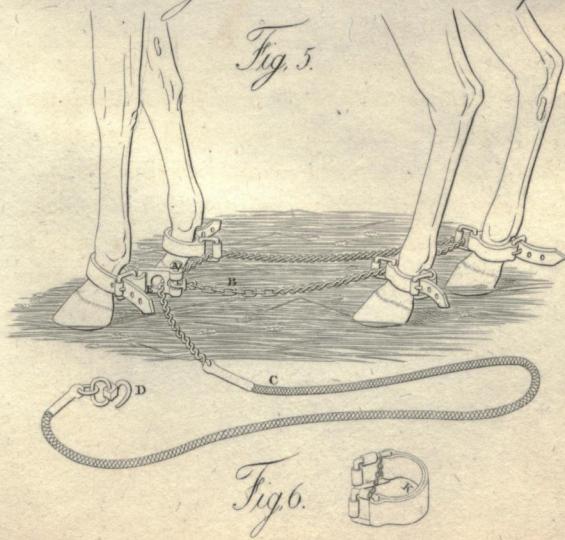
To each end of the breeching is attached a chain, which passing through a horizontal sheave or pully on the upper surface of each shaft, is ultimately fixed to the bar of the drag; while the bolts or forelocks remain in the holes behind the perforated plate before-mentioned, it is evident the brake cannot tighten upon or drag the wheel; but on either of those pins being removed, the wheels become immovable.

Fig. 1, shews the brake composed of a jointed iron hoop, each piece of which is lined with wood intended to press

M^r. J. Rapson's Drag for Carriages.



M^r. Bracy Clark's Hobbles for Horses.



press upon the nave of the wheel. The first, a fixed pivot A, is fixed to the under side of the frame of the cart; from the other extremity of the brake proceeds a bar B, which slides through the plate or socket C, fixed on the side of the cart frame a vertical perforation is made through the bar B, just behind the plate, to receive the pin D, which is likewise chained to the shaft: this pin so placed prevents any force applied to the chain from tightening the brake on the nave of the wheel.

Fig. 2. represents the interior of a wheel on level ground, the nave surrounded by the brake, which by its own gravity is hanging loose, leaving the wheel perfectly free.

Fig. 3, shews a wheel on a declivity, the chain drawn tight by the pressure of the breeching on the horse; the brake of course closely surrounding the nave, and forming an effectual drag.

Fig. 4, is a bird's-eye view of the whole apparatus, exhibiting the framing of the cart, the shafts, wheels and brakes; the chains also are shewn, passing from the bars on each side, each round a horizontal pully on the shaft, and attached to the ends of the breeching. From this it is evident, that when a cart prepared as above is going down hill; the load, pressing the breeching against the horse, draws the brake tight by means of the chain, and produces a friction on the nave proportioned in some measure to the declivity.

When backing upon level ground, by inserting the pins D, fig. 1, through the bars of the brakes, the wheels will be kept free.

The SILVER MEDAL was this Session voted to Mr. BRACY CLARK, Veterinary Surgeon, Giltspur-street, for his Hobbles, which safely cast Horses down, preventing danger to the Assistant and pain to the Animal. The following Communications were received from him, an explanatory Engraving is annexed, and the Apparatus is preserved in the Society's Repository.

BRACY CLARK presents his best respects to Dr. Taylor, and has transmitted to him his new invented hobbles for casting horses, and confining them during painful operations, which has heretofore been a considerable difficulty, and attended with much unnecessary cruelty to the animal, from the imperfect manner in which it has been usually done. They are laid before the Society of Arts, &c. for their approbation, that the knowledge of them throughout the kingdom may be more extensively diffused, by which means much unnecessary cruelty and injury to the animal may be prevented, with greater security and convenience to the operator.

These hobbles have now been in frequent use for six years, which long trial of them has served fully to prove their great utility and advantages over any apparatus hitherto used for the purpose; they are more easy to cast the horse, more durable, and more secure. They release, in a remarkable manner, all four legs at once after the operation for which the horse is cast is performed, instead of undoing a leg at once as heretofore. The King's Life Guards have used them more than five years, and found them so useful and convenient, that they have just ordered another set. Indeed their simplicity on inspection must

must make their advantages very obvious without a more particular explanation.

Giltspur-street, 31st, 1st Month, 1815.

To C. TAYLOR, M.D. SEC.

CERTIFICATES.

DEAR SIR,

IT is with great pleasure that I can conscientiously testify to the utility of the Hobbles invented by you, which I have used more than five years. Their durability is one advantage, but the greatest attending them is, from the firmly fixed position of the animal, and the perfect security of the operator. My life was once endangered by the giving way of the old hobbles, but now I perform every operation without dread.

My assistants join me in the approval of them, they being secured from the danger heretofore incurred by freeing one leg at a time.

I am, dear Sir,

Your faithful friend,

SAMUEL BLOXAM,

Veterinary Surgeon, 1st Life Guards.

Barracks, Jan. 30, 1815.

To Mr. BRACY CLARK, Vet. Surgeon.

CERTIFICATES to a similar effect were received from Messrs. J. and W. HARRISON, Veterinary Establishment, Little Moorfields.

R. H. BUDD, No. 56, Lower East Smithfield.

JOHN PAYTON, Assistant Veterinary Surgeon.

CHARLES NEWPORT, Veterinary Surgeon, Gray's-Inn-Lane.

I. 2

Description

Description of the New Casting Hobbles, invented by Bracy Clark, F.L.S. Veterinary Surgeon, &c. Plate 14, Figs. 5, 6.

As it is by practical improvements the veterinary art must be advanced in utility and estimation with the public; so I shall feel happy, if this little invention may be considered in a small degree contributing thereunto. This improvement in the apparatus for casting horses, and better securing them for operations, presented itself to me about six years ago; the great advantages of this plan having been fully confirmed by frequent use during this period, I have been induced to make it more publicly known.

In this way, the most painful operations may be performed upon this powerful animal with perfect safety; and I rejoice the more at the success of these means, as I well remember, in the commencement of my studies in this art, that casting the horse was attended with so much trouble and difficulty from being badly performed, that instead of it, severe twitches were had recourse to, during an operation, applied to the nose as well as the ears; and he was often cruelly beaten with whips and sticks, to make him stand quiet during the performance of firing or other operations, for which there can now be no occasion.

In casting horses after the common mode, some straw, enclosed in a knot, was used to form an obstacle to the return of the rope through the four rings; and, in order to insert it, it became necessary to relax the rope for a time, during which, if the horse struggled, he would draw the cord back through the rings, and sometimes get upon his legs again; this imperfection is wholly removed by the present

present apparatus. The knot of straw being also drawn tighter, and condensing by the struggling of the horse, would give a degree of liberty to the legs, that was often inconvenient in performing an operation, which is also removed by the present apparatus, which can be drawn as tight as you please, and afterwards is subjected to no relaxation. But a much greater advantage than the foregoing, is, that all the four legs are released at once, and the inconvenience and risk of undoing a leg at a time, after the old mode, is entirely done away. The friction and strain of these new hobbles are chiefly confined to the iron parts, which give them a duration in wearing that is almost endless. The iron chain, terminating the rope, passes or slides through the rings with less friction, if well made, than a rope would do; and, by the use of steel rollers, it acquires much less force, or fewer men in casting the horse.

The apparatus itself is represented in the plate annexed, and the following brief description will enable the reader to form a correct idea of the nature of it:—one of the hobbles, it will be observed, is made different from the rest, which we call the principal or master hobble; it is seen on the near fore leg, and is always to be placed or fixed on the fore leg of that side of the horse that is designed to be uppermost when on the ground; the end of the chain is fastened to this hobble, by means of the moveable pin A, fig. 5, which is prevented from falling out with any agitation of the apparatus, by having two or three turns of a screw in its upper part, under the thumb piece A. The chain B terminates in a swivel, received into a notch through which the pin passes, and the links of this end of the chain are made open and plain, for receiving the hook for fastening him; the rest of the links

are twisted and shorter, to run more readily upon the rings. To this chain is attached a cord C. We have preferred one of those called patent ropes, being plaited of strands of equal tension, and are found not only stronger but more flexible than common ones: at the extremity of this cord is attached, for convenient use, and to prevent its being lost, the oblong curved hook of iron D.

It would appear almost needless to describe the manner of using or applying the apparatus, as it is so simple, and the plate so plainly indicates it; it is evident that on drawing the rope, the legs are forced together, and the horse is thrown down, some straw being placed on the ground to receive him: he is no sooner down and the feet drawn together, than the hook D, is passed through one of the open links of the chain, which, as it cannot then return back through the perforation in the plate E, he becomes perfectly fixed, far more conveniently and effectually, than by any noose or knot that could be devised.

The operation being performed, the removal of the pin A, sets the horse at liberty again, as the extremity of the chain can then pass without impediment through all the rings, and his four feet are all released at once.

Fig. 6, K, shews one of the hobbles separate, and on a larger scale. We may observe, that each hobble ring, except the principal, is provided with a steel roller, or case of plate steel, which, turning readily upon the iron, serves to diminish friction, though it has been found, if made simply, of a large half-round iron ring, in which way this apparatus has been used several years in the King's body guard, to answer particularly well, yet we think the rollers preferable; and it may not be without its use to remark, that if the steel moveable cases or rollers

are

are resorted to, they should be made of very stout plate steel, so strong that the chain should not, in passing through the rings, or in the struggles of the horse after he is down, be subject at all to force or indent them, which would render them perfectly useless.

The horse's tail having great command of him under the circumstances of his being poised and about to fall, has been usually my post of duty in this process; and frequently, in the moment of balancing, the opportunity is afforded of deciding the fall on the side we wish; a steady confidential man also should be placed at the head, and another of this description should manage the rope next the hobbles, taking a short hold almost close to the apparatus, pushing with the other hand against the shoulder or side of the horse, and renewing his hold as the rope passes; this, however requires some adroitness, as the horse may, if it is resorted to too soon, lean towards it, which they are apt to do when any thing is pressing against them, and so fall on the near side, that it should be desisted from if this is likely to take place, but may much assist if duly used.

In the moment of pulling the rope stationed at the tail, I take the opportunity with my foot of touching pretty sharply the hind leg on the off side, or side from the casting rope; and as he lifts up, it is drawn inwards towards the centre of the body, and greatly assists in the operation, determining also in general his fall on that side.

One hint more I might also subjoin, in respect to handling the horse; for, it is very common to see the shoeing-smiths about any operation of this sort, of a painful kind, approach the horse with a timidity and suspicion, and touch his legs and other parts with their fingers' ends, thereby creating an unnecessary alarm and irritation: he should,

should, on these occasions, be approached with confidence, and the flat hand be used with great freedom.

BRACY CLARK.

Giltspur-Street, Feb. 2nd, 1815.

The SILVER MEDAL and TEN GUINEAS were this Session voted to Mr. JOHN BARROW, York Court, East Street, Manchester Square, for a Double Door Spring. The following Communication was received from him, an explanatory Engraving is annexed, and the Spring preserved in the Society's Repository.

SIR,

You will very much oblige me by laying before the Society of Arts, &c. the model of a double door spring, which accompanies this letter. I have shown it to persons well acquainted with mechanics, who approve of its simplicity and principle. It is a spring for a door that swings both ways, and will be found to keep the door more steady when shut than any that I have seen or heard of. I will with pleasure attend and give the Committee any further explanation they may require.

The price of it will be about two guineas. Its power originates from a helical spring contained within the barrel. The action resembles that of the spring of the tumbler of a gun-lock; and it may be fixed either at the top or bottom of a door. Its strongest action is when the door

PLATE

M. J. Barou's Double and Single Door Springs.

Fig. 3.

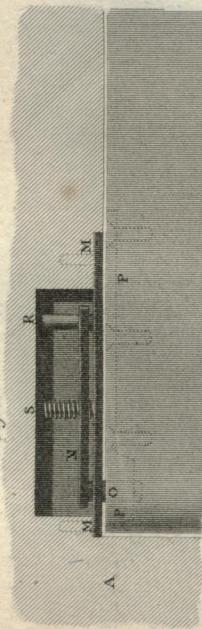
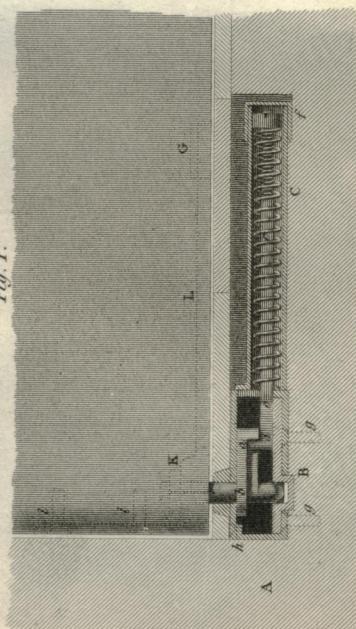


Fig. 1.



under-side



Fig. 2.

Fig. 5.

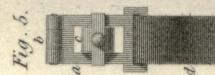


Fig. 4.

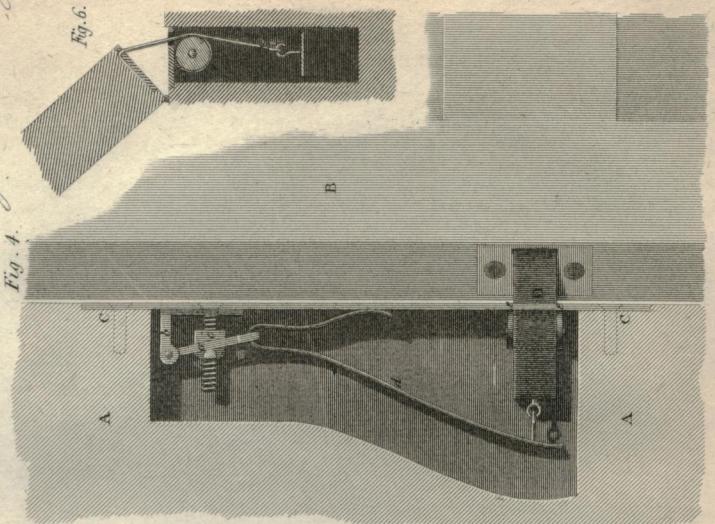
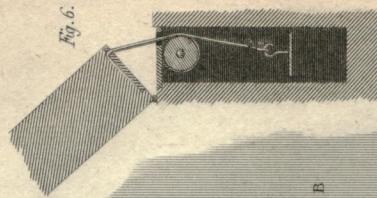


Fig. 6.



Drawn & Engraved by G. Gladwin.

door is shut ; it eases itself in opening ; and the power of the spring may be easily increased or diminished.

I am, Sir, with great respect,

Your obedient humble servant,

JOHN BARROW.

No. 23, York Court, East Street, Manchester Square,

March 29th, 1815.

To C. TAYLOR, M.D. SEC.

Reference to the Engraving of Mr. J. BARROW's Double Door Spring Apparatus.—Plate 15. Figs. 1, 2, 3.

Figs. 1, 2, 3, represent three several views of a very complete and simple spring apparatus, which, when attached to any door, will have the power of keeping it shut when the means applied to open it are removed.

Fig. 1 represents part of a door, with one of these instruments applied to it. A A is the door frame ; B C is a section of the metal-box, that contains the spring apparatus, which is fixed firmly below the floor ; the axle b projecting sufficiently above the floor, to receive the brass or iron knee-frame g b, which is kept on the axle by the nut K; and the knee frame is fixed to the bottom and usual hinge edges of the door. The door so united to the knee frame requires only the pivot N to work in the hole O, at the top of the door, which is shown in Fig. 3. Any door having these instruments will not require any other hinges. To the bottom axle or pivot b, is fixed the triangular pellat, or double curved lever a, which lifts the rod c, c, whichever way the door is opened ; and by which motion the spring is compressed against the top of the spring cylinder ; and when the door is disengaged by the act of opening, the spring extends itself, and pulls down the

the rod c, c, by acting against the rod nut f ; and thus constantly shuts the door. This operation is performed with equal certainty and effect, whatever way the door is opened.

Fig. 2, are under views of the pellat or double curved lever a, with the two prongs d, which are at the top of the rod c, c, resting in the pellat stops.

Fig. 3, is a sectional view of the contrivance for the upper pivot and plate from which the door swings, and is supported at the top of the frame. M M is a brass box that contains the upper pivot work ; and which is let into the top of the door frame. P P is a metal plate, screwed to the upper edge of the door ; o is the pivot hole ; N the pivot and bar, and which pivot is lowered or elevated by the screw S ; the pivot bar rising or falling as required on the guide rod R ; the door is thus put into its frame, and the pivot N is gradually lowered into the pivot hole o, by throwing the door open to allow the screw S to be turned, by which the pivot bar is brought down.

*The SILVER ISIS MEDAL was this Session voted to
Mr. JOHN BARROW, York Court, East Street,
Manchester Square, for a Single Door Spring.
The following Communication was received from
him, an explanatory Engraving is annexed, and
the Spring preserved in the Society's Repository.*

SIR,

I beg leave to lay before the Society a single door spring, which has the advantage of not being seen when the door is shut. The price of it will be about ten shillings ; it has been

varies the power of the spring according to the weight of the door.
been actually tried, and answers in use. Its effect is produced from a spring and leather strap.

I remain, Sir,

Your obedient servant,

JOHN BARROW.

No. 23, York-Court, East-Street, Manchester-Square,
March 29th, 1815.

To C. TAYLOR, M. D. SEC.

Reference to the Engraving of Mr. J. BARROW's Single Door Spring. Plate 15, Figs. 4, 5, 6.

Figs. 4, 5, 6, are views of a very simple and cheap contrivance for a single door spring, or apparatus to shut any door to which it is attached; and may, with facility, be applied to any door now in use. A A is a section of part of a door-post or rail, in which is inserted the spring apparatus, after the manner of a mortice lock or latch; and as near as convenient to the middle of the height of the door. B represents the door in an opened position, supported by ordinary hinges, and which shows the leather strap D; one end of which is fastened by a loop or eye to a brass or iron plate and pin; and which are inserted and screwed to the edge of the door on which the hinges are placed; the other end of the strap is by a similar loop connected to the spring d; the strap, thus extended, traverses over a small brass roller that is fixed behind the plate e, e; this application not only prevents any considerable wear in the strap, but reduces the noise and friction when in constant use. C C is the brass or iron plate, or box, that holds the spring apparatus; b is the joint standard, in which the spring regulator a, moves; c is the screw and nut, which adjusts and

Fig.

Fig. 5 shows an upper view of the parts last mentioned, and fig. 6 the action of the leathern strap upon the brass roller, and its connection with the door and spring.

The SILVER MEDAL was this Session voted to Mr. JAMES BRABY, of Pedlar's Acre, Lambeth, for a Weighing Machine for family use. The following Communication was received from him, and the Machine is preserved in the Society's Repository.

SIR,

I BEG leave to lay before the Society of Arts, &c. a new balance of my invention, with a constant self-acting weight, by which goods of any description may be weighed with accuracy. I call it a domestic balance from its being more particularly adapted for family purposes, such as weighing meat, bread, butter, &c. for which I conceive it will be far preferable to weights and scales, the weights being often lost or misplaced by servants. The common steel-yard is also unhandy for domestic use, as it has no scale to place the goods in, nor will it weigh sufficiently accurate to detect short weight in small articles. I trust this new balance will not be liable to these objections; it can be made to carry any weight and will take up very little room in a kitchen, or any other place, as it hangs flat against the wall when not in use; is not liable to be damaged or put out of repair, and always ready for use without any trouble. I hope the Committee will examine it, and if entitled to reward, it will be gratefully received by, Sir, Your most obedient Servant,

JAMES BRABY.

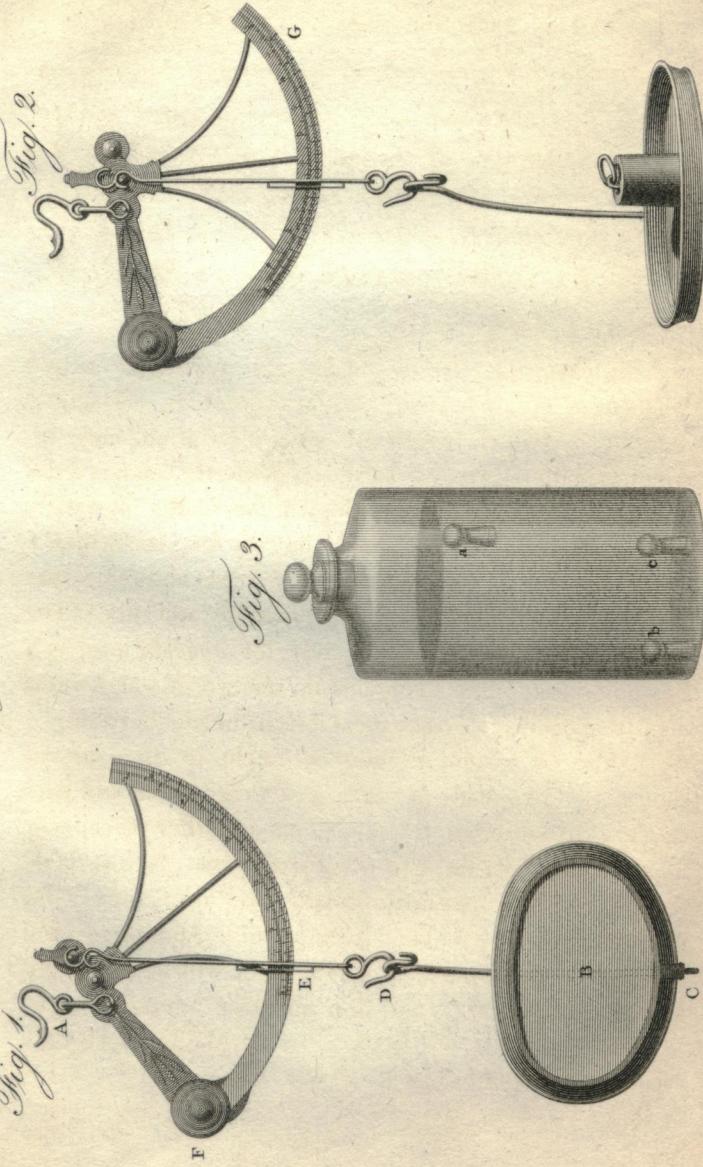
Fine-street, Pedlar's-Acre, Lambeth, April 11, 1815.

To C. TAYLOR, M.D. SEC.

Reference

M^r Braly's Domestic Balance.

Fig. 1.

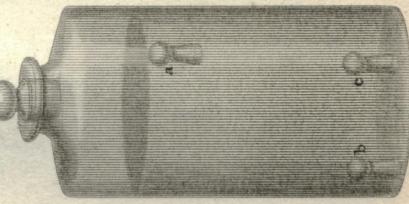


Pl. 16.

J. Beeson Sculp.

M^r London's Hydrometer.

Fig. 3.



W. Newson, Del.

Reference to the Engraving of Mr. Braby's Domestic Balance, to supersede the necessity of Weights, being an improvement upon Steel-yards. See Plate 16, Figs. 1 & 2.

The fulcrum or point of suspension in this instrument is a lever of the first order.

The weight is fixed at the longer arm of the lever. The balance, or scale for weighing, is to be suspended on one of the two centres situated on the shorter arm of the lever.

The graduated scale of weights is divided upon a segment of a circle, occupying about 140 degrees, the divisions being in two rows, each calculated for and tending to the respective centre upon which the balance and its index is to be suspended.

Fig. 1, represents the domestic balance, which is to be suspended by its hook A, from a pin in the wall, and for the convenience of occupying little room, the scale B is here turned up flat by a joint C; it thus permits articles too large for the scale to be hung upon the hook D, to be weighed.

The balance and index in this figure are placed upon that centre which is most distant from the fulcrum, and is intended for weighing goods under five pounds. The inner row of divisions tending to this centre graduated upon the arch up to No. 5, represent pounds subdivided into halves, quarters, and ounces; the index, which is a thin edge E, on the side of the balance rod in this figure, stands at 0, or Zero, the scale being empty. According to the quantity of goods put into the scale, the weight F, at the longer end of the lever, will rise until it hangs in equilibrio; the index will then shew, by the mark of the graduation, the weight of the goods in the scale.

To

To weigh any articles exceeding five pounds weight, the balance rod is to be suspended upon that centre or pivot nearest to the fulcrum, as shewn in Fig. 2; the purchase being less, a greater weight may be suspended in equilibrio; in this case the outer row of divisions G, intersected by the index, will shew any weight in the balance very accurately as far as fifteen pounds, the extent for which this instrument was intended. In this figure the scale is let down in the position most favourable for articles to be generally weighed, the weight within it serving merely to shew how the article to be weighed is to be placed.

* * * Since the above Apparatus was rewarded by the Society, Mr. Braby has made considerable improvements therein, by which a machine of the same size will weigh double the weight, and accurately shew the divisions of a pound into half-ounces. He has also placed one of the improved machines in the Society's Repository.

Mr. Braby has made several machines upon the same principle, capable of weighing one hundred weight, but the sizes he recommends as most generally useful are those to weigh half a hundred.